each resonance is proportional to ^2H-enrichment at that position, so the spectrum provides a simple and direct readout of ^2H enrichment ratios.

[0038] It is important to point out that the ^2H NMR measurement is not influenced by the presence of tracer levels of ^{13}C in the glucose (or monoacetone glucose) molecule. Table 1 summarizes the relative contributions of glycogen, glycerol and PEP to glucose production as measured by deuterium NMR of monoacetone glucose derived from blood glucose. Fluxes through key pathways involving the TCA cycle were measured relative to flux through citrate synthase by analysis of carbon-13 NMR spectra from urinary acetominiphen glucuronide or urinary phenylacetylglutamine. The equation (eqn) used to ~~caculate~~ calculate a given value is ~~incicated~~ indicated.

TABLE 1

Sources of glucose (fraction. from ^2H NMR of blood monoacetone glucose)				Flux ratios relative to citrate synthase (from ^{13}C NMR of urine acetaminophen glucuronide)			Flux ratios relative to citrate synthase (from ^{13}C NMR of urine phenylacetylglutamine)		
subject	glycogen (eqn 1)	glycerol (eqn 2)	PEP (eqn 3)	OAA→PEP (eqn 4)	PEP→pyruvate (eqn 5)	PEP→glucose (eqn 6)	OAA→PEP (eqn 7)	PEP→pyruvate (eqn 8)	PEP→glucose (eqn 9)
A	0 57	0 00	0 43	6.61	5.18	1.44	6.58	5.90	0 69
B	0.55	0 06	0.39	7.41	5.10	2.31	6 34	5.44	0 90
C	0.43	0 01	0 56	5.50	3 76	1.74	6 15	5.03	1.12
D	0 45	0 06	0 49	7 51	5.62	1.89	6.80	5.73	1.07
E	0.59	0 03	0 38	8 85	6 68	1.85	5.66	4 96	0.70
mean	0.52	0.03	0.45	7 11	5 27	1.85	6 31	5 41	0.90
s.d.	0.07	0.03	0.08	1 13	1 05	0 31	0.44	0 41	0.20

TCA cycle and gluconeogenic flux measurements from [U-$^{13}C_3$]propionate incorporation into hexose and PAGN.

~~TCA cycle and gluconeogenic flux measurements from [U-$^{13}C_3$]propionate incorporation into hexose and PAGN~~

[0039] Relative anaplerotic, pyruvate recycling, and gluconeogenic fluxes can be obtained by a ^{13}C isotopomer analysis of plasma glucose, urinary glucuronide, or the glutamine fragment in urinary PAGN. The equations that describe these relationships are given by eqns. 4-9.

[0040] Figure 5 illustrates typical multiplets observed in the ^{13}C NMR spectrum of plasma glucose C2β and urinary glucuronate C5β of the same individual. The multiplet pattern arises from metabolism of [U-$^{13}C_3$]propionate at the level of the liver TCA cycle and is not affected by the presence of or metabolism of [1,6-$^{13}C_2$]glucose. The difference in signal-to-noise in these two spectra is largely due to the amount of urinary glucuronate in ~100-150 mL of urine compared to the amount of glucose in 10 mL of blood. Given that the multiplets in blood glucose C2β and urinary glucuronate C5β report identical flux values and the large differences in signal-to-noise of the spectra shown, relative flux values as reported by the glucuronate

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Dear Supervising Examiner Warden:
Per your instructions delivered by voicemail on May 10, 2007, provided by facsimile are two substitute sheets for pages 22 and 23 of the specification with a new copy of Table 1 and corrections of two typographical errors in paragraph [0038]. Kindly confirm receipt.

Monique Monique A. Vander Molen

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